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10/611,593	06/30/2003	Marie-Laure Lesaicherre	6565-66285/RJP	5201

EXAMINER	
YANG, NELSON C	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/611,593

Applicant(s)

LESAICHERRE ET AL.

Examiner

Nelson Yang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 17-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendment of claims 1, 4, 9, and 11 is acknowledged and has been entered.
2. Claims 1-20 are pending.
3. Claims 17-20 have been withdrawn.
4. Claims 1-16 are currently under examination.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Nock et al. [US 2002/0049152].

With respect to claims 1, 9, Nock et al. teach a method of immobilizing a polypeptide to a surface using mutant inteins (para. 0045), wherein the amino-terminal end of the intein is capable of splicing of the N-extein to the C-extein, forming thioesters with an activating compound at the end of the extein (para. 0059). Specifically, Nock et al. teach expressing a chimeric gene that encodes a fusion protein which comprises a polypeptide and an intein (para. 0013), attaching anchor molecules to the polypeptides and anchoring the polypeptides to a surface (para. 0014).

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7. With respect to claims 2, 10, Nock et al. teach that tags may be used to attach the polypeptides to the surface to form arrays or for purification of the polypeptides (para. 0065), wherein the tags may be avidin (claim 12), which would bind to biotin.

8. With respect to claim 3, the substrate of the array may be glass (para. 0119).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 4, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nock et al. [US 2002/0049152], as applied to claims 1, 9 above, and further in view of Duan [US 6,951,742].

With respect to claims 4, 11 Nock et al. teach a method of immobilizing a polypeptide to a surface using mutant inteins (para. 0045), wherein the amino-terminal end of the intein is capable of splicing of the N-extein to the C-extein, forming thioesters with an activating compound at the end of the extein (para. 0059). Specifically, Nock et al. teach expressing a chimeric gene that encodes a fusion protein which comprises a polypeptide and an intein (para. 0013), attaching anchor molecules to the polypeptides and anchoring the polypeptides to a surface (para. 0014). Nock et al. fail to teach that the proteins are expressed by a pTYB1 expression vector.

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Duan, however, teaches the use of pTYB1 vectors to express fusion proteins, and further teach that pTYB1 vectors allow the cloning of a target gene immediately adjacent to the intein cleavage site, which results in the purification of a native target protein without any vector derived extra residues after the cleavage (column 32, lines 52-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a pTYB1 expression vector to express the fusion proteins of Nock et al., as suggested by Duan, in order to allow the cloning of a target gene immediately adjacent to the intein cleavage site, allowing for the purification of a native target protein without any vector derived extra residues after the cleavage.

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nock et al. [US 2002/0049152] in view of Duan [US 6,951,742] as applied to claim 4 above and further in view of Xu et al. [US 7,001,745].

With respect to claim 5, Nock et al. teach a method of immobilizing a polypeptide to a surface using mutant inteins (para. 0045), wherein the amino-terminal end of the intein is capable of splicing of the N-extein to the C-extein, forming thioesters with an activating compound at the end of the extein (para. 0059). Specifically, Nock et al. teach expressing a chimeric gene that encodes a fusion protein which comprises a polypeptide and an intein (para. 0013), attaching anchor molecules to the polypeptides and anchoring the polypeptides to a surface (para. 0014). Nock et al. fail to teach that the ligand is cysteine-biotin and reacting the fusion protein with cysteine-biotin.

Xu et al., however, teach a biotinylated peptide possessing an N-terminal cysteine (column 7, lines 11-18), fused to the fusion protein (column 7, lines 10-18), and further teaches that in the presence of MESNA, the efficiency of the ligation is typically greater than 90% (column 7, lines 20-22).

Therefore, one of ordinary skill in the art at the time of the invention would have been motivated to have used biotinylated peptides possessing an N-terminal cysteine in the method of Nock et al. and Duan, as suggested by Xu et al., in order to increase the efficiency of ligation.

12. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nock et al. [US 2002/0049152] in view of Duan [US 6,951,742] and Xu et al. [US 7,001,745], as applied to claim 5 above, and further in view of Bradley et al. [US 2002/0006623].

With respect to claims 6, 7, Nock et al. teach a method of immobilizing a polypeptide to a surface using mutant inteins (para. 0045), wherein the amino-terminal end of the intein is capable of splicing of the N-extein to the C-extein, forming thioesters with an activating compound at the end of the extein (para. 0059). Specifically, Nock et al. teach expressing a chimeric gene that encodes a fusion protein which comprises a polypeptide and an intein (para. 0013), attaching anchor molecules to the polypeptides and anchoring the polypeptides to a surface (para. 0014). Nock et al. fail to teach that the glass support is derivatized with an epoxy silane compound such as glycidoxypopyl trimethoxysilane.

Bradley et al., however, teach the derivatization of glass supports with glycidoxypopyl trimethoxysilane (para. 0127), and further teach that glycidoxypopyl trimethoxysilane is rapid, and occurs under very mild conditions using a minimum of inexpensive reagents (para. 0128).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have derivatized the glass supports of Nock et al. with glycidoxypopyl trimethoxysilane, as suggested by Bradley et al., in order to be able to attach ligands to the glass support rapidly, and under very mild conditions while using a minimum of inexpensive reagents, which would render it cheaper, quicker, and simpler than other methods.

13. With respect to claim 8, Nock et al. teach streptavidin (claim 12).

14. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nock et al. [US 2002/0049152] in view of Duan [US 6,951,742] as applied to claim 11 above, and further in view of Inoue et al. [US 2002/0123101].

With respect to claim 12, Nock et al. teach a method of immobilizing a polypeptide to a surface using mutant inteins (para. 0045), wherein the amino-terminal end of the intein is capable of splicing of the N-extein to the C-extein, forming thioesters with an activating compound at the end of the extein (para. 0059). Specifically, Nock et al. teach expressing a chimeric gene that encodes a fusion protein which comprises a polypeptide and an intein (para. 0013), attaching anchor molecules to the polypeptides and anchoring the polypeptides to a surface (para. 0014). Nock et al. fail to teach that or that the fusion protein is contacted with a chitin column.

Inoue et al., however, teach that chitin column are commonly used for purification of proteins. (para. 0217).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention for Kurz et al. and Duan to have the fusion proteins come in contact with a chitin column, in order to purify the protein, as suggested by Inoue et al., so that there would be no

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contaminants that would potentially interfere and contaminate the protein array, thus allowing for better quality in the protein arrays produced.

15. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nock et al. [US 2002/0049152] in view of Duan [US 6,951,742] and Inoue et al. [US 2002/02123101], as applied to claim 12 above, and further in view of Xu et al. [US 7,001,745].

With respect to claim 13, Nock et al. teach a method of immobilizing a polypeptide to a surface using mutant inteins (para. 0045), wherein the amino-terminal end of the intein is capable of splicing of the N-extein to the C-extein, forming thioesters with an activating compound at the end of the extein (para. 0059). Specifically, Nock et al. teach expressing a chimeric gene that encodes a fusion protein which comprises a polypeptide and an intein (para. 0013), attaching anchor molecules to the polypeptides and anchoring the polypeptides to a surface (para. 0014). Nock et al. fail to teach that the ligand is cysteine-biotin, and the step of attaching the ligand comprises adding cysteine biotin to a chitin column.

Xu et al., however, teach a biotinylated peptide possessing an N-terminal cysteine (column 7, lines 11-18), fused to the fusion protein (column 7, lines 10-18), and further teaches that in the presence of MESNA, the efficiency of the ligation is typically greater than 90% (column 7, lines 20-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used biotinylated peptides possessing an N-terminal cysteine in the method of Nock et al. and Duan, as suggested by Xu et al., in order to increase the efficiency of ligation.

16. With respect to claim 14, Nock et al. teach substrates comprising glass (para. 0119).

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17. With respect to claim 15, Nock et al. teach streptavidin (claim 12).
18. With respect to claim 16, Duan teaches spotting the protein onto a solid surface to form an array (column 37, lines 1-25).

Response to Arguments

19. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

20. No claims are allowed.
21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

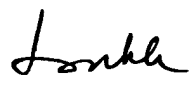
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22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson Yang whose telephone number is (571) 272-0826. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long V. Le can be reached on (571)272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nelson Yang
Patent Examiner
Art Unit 1641


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